REMARKS

Claims 1, 3, 5, 7-9, 11, 24, 28, 32, 34-43 and 45-48 are pending. In this amendment, claims 1, 8, 11 are amended. Claims 49-53 are added. Support for the amendment and new claims can be found at page 8, lines 11-17, page 11, lines 8-40, page 17, and elsewhere in the specification.

Rejections Under 35 U.S.C. §103(a)

All of the claims have been rejected as obvious. Two references common to all of the rejections are Haswell et al., Lab on a Chip (2001), pp. 164-166 in view of Tonkovich et al. (US Patent No. 6,488,838).

Haswell et al. describe an experiment in which a thin tube was packed with catalyst beads. See page 165 under the heading "Flow experiments." Haswell et al. made the catalyst beads by immobilizing a nickel complex onto resin beads. Haswell et al. reported reaction rates for the Kumada-Corriu reaction compared between the packed microchannel tube and a batch reactor. Haswell et al. reported that the reaction proceeded much faster in the microchannel as compared with the batch reaction.

The Tonkovich reference is cited to show that a conventional way to accomplish heat transfer in a microchannel reactor is to arrange a heat transfer microchannel adjacent to the reaction channel.

Claims 1, 8, and 11 are now amended to recite that the microchannel comprises a bulk flow path. First, it may be mentioned that pending claim 3 already recited a bulk flow path. The specification describes bulk flow paths at pages 8 and 11. Pages 17-19 of Applicants'

specification describes an example of the inventive system for conducting the Knoevenagel reaction. On page 19, Applicants show that the use of a tethered catalyst in a microchannel having a bulk flow path produced superior results as compared to the same reaction in a packed microchannel. As stated on page 19, "These results demonstrate the significantly higher yields at much shorter residence times when this type of catalyst is tethered to the walls of a microchannel reactor compared to conventional packed bed or packed microreactors." Thus, applicants have established surprising and superior results as compared to the prior art (i.e., as compared to a packed microreactor as in the Haswell reference). In view of these unexpected results, applicants have established nonobviousness of the claimed invention.

Therefore, withdrawal of the section 103 rejection of independent claims 1, 8, and 11 is respectfully requested.

Claim 28 has been rejected as being obvious over Haswell in view of Tonkovich and further in view of Hoveyda et al. This rejection is respectfully traversed. Claim 28 recites that the microchannel comprises a chiral auxiliary. None of the cited references suggest the desirability of using a chiral auxiliary in a microchannel.

Dependent claims 32, 40, 41, 43, 45, 46, and 48 have been rejected over Haswell in view of Tonkovich and further in view of Kang, Hoveyda, Chapman, or Ostoja-Starzewski. These dependent claims are non-obvious for the same reasons as the independent claims from which they depend.

Conclusion

If the Examiner has any questions or would like to speak to Applicants' representative, the Examiner is encouraged to call Applicants' attorney at the number provided below.

Respectfully submitted,

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